DOCUMENT RESUME

ED 232 501 HE 016 363

TITLE	Facing the Issue of Facilities Maintenance in California Public Higher Education.
INSTITUTION	California State Postsecondary Education Commission, Sacramento.
REPORT NO	CR-83-20
PUB DATE	21 Apr 83
NOTE	34p.
AVAILABLE FROM	California Postsecondary Education Commission, 1020 Twelfth Street, Sacramento, CA 95814.
PUB TYPE	Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Administrative Policy; Budgeting; Building Operation; Campus Planning; *College Buildings; Community Colleges; *Educational Facilities Improvement; Equipment Maintenance; Financial Problems; Higher Education; Multicampus Colleges; Operating Expenses; Problem Solving; Public Education; Resource Allocation; *Retrenchment; *School Maintenance; *State Colleges
IDENTIFIERS	California Community Colleges; *California State University; *University of California

ABSTRACT

The decision to defer facilities maintenance obligations in California higher education and the extent to which maintenance has been deferred are discussed. Attention is also directed to the educational and fiscal context in which this decision has been made nationally. The policies and procedures governing facilities maintenance and deferral in California's three segments of public higher education are examined. In addition, current efforts to resolve problems stemming from deferral and their potential impact in light of the likely future of higher education in California are addressed. The University of California has taken a decentralized approach to facilities maintenance, allowing each campus to develop its own administrative and procedural framework and resolve its problems within broad policy and budgetary guidelines. In contrast, the State University is implementing a comprehensive systemwide program of facilities maintenance management. The challenge set by the facilities maintenance dilemma can be traced to three causes: insufficient funding, diversion of funding to other priorities, and inadequate maintenance procedures. Four possible sources of funds to support deferred maintenance are identified, along with procedures that are needed (e.g., preventive maintenance programs and accountability procedures). (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED232501

FACING THE ISSUE OF FACILITIES MAINTENANCE IN CALIFORNIA PUBLIC HIGHER EDUCATION

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
California PSE Comm
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

NE016363

CALIFORNIA POSTSECONDARY EDUCATION COMMISSION
1020 Twelfth Street, Sacramento, California 95814

Commission Report 83-20

Adopted April 21, 1983

CONTENTS

		Page
PREFACE		v
	Scope of the Report	v
	Definitions of Facilities Maintenance	v
ONE:	FACILITIES MAINTENANCE IN AMERICAN HIGHER EDUCATION	1
	The Golden Age of the '50s and '60s	1
	Constraints of the '70s and '80s	1
TWO:	FACILITIES MAINTENANCE IN CALIFORNIA	5
	Current Facilities Maintenance	6
	Current Facilities Maintenance at the University of California	7
	Current Facilities Maintenance at The California State University	10
	Current Facilities Maintenance at the California Community Colleges	12
	Deferred Maintenance	13
	Deferred Maintenance at the University of California	13
	Deferred Maintenance at The California State University	15
	Deferred Maintenance at the California Community Colleges	18
	Summary	20
THREE:	CONCLUSIONS	21
BIBLIOGRAPHY		27

TABLES

		Page
1.	University of California Expenditures for Operation and Maintenance of Plant (OMP) Compared to Total Institutional Expenditures, in Thousands of Dollars, 1972-73 to 1982-83	8
2.	University of California Expenditures for Operation and Maintenance of Plant (OMP) by Subcategories, in Thousands of Dollars, 1972-73 to 1982-83	8
3.	California State University Expenditures for Physical Plant Operations (PPO) Compared to Total Institutional Expenditures, in Thousands of Dollars, 1972-73 to 1982-83	10
4.	California State University Support for Physical Plant Operations (PPO) by Source of Funds, in Thousands of Dollars, 1981-82 to 1983-84	12
5.	University of California Approved Deferred Maintenance Projects and Budgeted Expenditures by Source of Funds, in Thousands of Dollars, 1972-73 to 1982-83	15
6.	California State University Backlog of Maintenance Projects and State Appropriations for Special Repair, in Thousands of Dollars, 1978-79 to 1982-83	16

PREFACE

California higher education is facing a fiscal crisis of a magnitude unparalleled in recent times. The cumulative effect of a stagnating economy and taxpayers' resistance to high taxes has been a revenue-cost squeeze on all aspects of higher education. College and university leaders have implemented a wide range of revenue-enhancing and cost-cutting efforts to maintain the financial viability and educational quality of California's institutions of higher learning despite limited resources. By 1982-83 cost cutting has included deferring facilities maintenance obligations, delaying replacement of instructional equipment, limiting renovation of academic buildings, restricting library purchases, implementing energy saving innovations, cutting staff, and revising and consolidating academic programs.

SCOPE OF THE REPORT

This report examines the first of these options--the decision to defer facilities maintenance obligations. Part One examines the educational and fiscal context in which this decision has been made nationally. Part Two examines the extent to which maintenance has been deferred in California as well as the policies and procedures governing facilities maintenance and its stepchild "deferred maintenance" in California's three segments of public higher education. Part Three reviews current efforts to resolve problems stemming from deferral and discusses their potential impact in light of the likely future of higher education in California.

DEFINITIONS OF FACILITIES MAINTENANCE

In general, facilities maintenance is the process required to maintain or restore facilities as close as practicable to their original condition until useful life requires replacement (Kaiser, 1979). In discussions of facilities maintenance, three types of maintenance are often distinguished: regular, preventive, and deferred.

Regular: Regular maintenance, in theory, is the day-to-day process supported by resources allocated annually and expended in a scheduled manner to control deterioration of colleges and universities facilities. In practice, regular maintenance include routine repetitive work as well as trouble calls and care for emergency or near emergency situations (Kaiser, 1979).

Preventive: Preventive planned maintenance is periodic work including scheduled inspections, lubrication and/or other servicing of capital equipment and the condition of buildings to ensure against further deterioration and to maintain the original condition of the facilities and their components (Bowman, 1977). Private industry and the military services have been

performing regular, routine, preventive maintenance for years; and warranties based on required maintenance schedules illustrate the concept. But preventive maintenance is much less common in the public sector, for highways and bridges as well as for educational institutions. Reasons offered for not having such a program include limited budgets, lack of trained personnel, lack of information about such programs and governing board apathy (Howell, 1977).

Deferred: The concept of deferred maintenance originated primarily in budgeting for regular maintenance of facilities or their components which allocates funds on an annual or biannual basis without including reserves for maintenance of items with maintenance cycles greater than one budget period. Thus, in terms of funding, deferred maintenance is resources expended in the periodic restoration of facilities that are deteriorating on a repair cycle greater than the budget period (Kaiser, 1979).

In practice, deferred maintenance has become synonymous with the backlog of maintenance needs that have been delayed because sufficient resources were not available or allocated. As this backlog grows and certain items are repeatedly delayed, the issue may move from maintenance into renewal, rehabilitation, and restoration, involving not only consideration of the expected usable life of the structure or system, but also effective utilization based on student and program needs, and possible functional obsolescence.

These considerations argue for including plant maintenance planning within an integrated, comprehensive approach to capital planning and thus making it an integral component of overall institutional planning. Some maintenance activities can be deferred only temporarily before violations of health and safety codes develop, while others threaten the very survival of buildings, since insufficiently maintained exteriors can lead to structural, mechanical, and electrical system damage. But delayed maintenance does more than weaken the physical plant, diminish fiscal flexibility, and limit future management choices, it can lead to loss of morale, enrollment, resources, and educational productivity.

This report does not argue that the highest priority of State and institutional decision makers should be the adequate maintenance of the academic physical plant. Instead, it seeks to improve understanding of the important role of facilities in the educational enterprise and the importance of maintaining these facilities so that State consideration of educational alternatives can proceed efficiently and effectively.

ACKNOWLEDGEMENTS

The Commission acknowledges with appreciation the assistance it has received in preparing this report from a technical advisory group consisting of Theodore Binkley of The California State University, Administrative Planning Officer; John A. Burnett of the University of California, Director of Facilities Maintenance and Construction; and John Picco of the California Community Colleges, Specialist in Facilities Planning.

ONE

FACILITIES MAINTENANCE IN AMERICAN HIGHER EDUCATION

Of the 80 institutions in the western world established prior to the year 1500 and still in existence, 70 are universities. In our relatively young nation, some of our oldest institutions are also colleges and universities. Thus the issues of the maintenance of higher education facilities are long standing, and many generations of educational leaders have had to grapple with them. With such a long history, these issues might seem easily addressed and resolved. Rapidly changing social and economic conditions over the last three decades, however, have expanded their magnitude dramatically. Unless we rethink these issues and formulate appropriate strategies for dealing with them during the remainder of the 1980s, they will continue to multiply.

THE GOLDEN AGE OF THE '50s AND '60s

The 1950s and 1960s have been characterized as the "golden age" of higher education. They saw unprecedented growth in educational participation and financial support for institutions of higher learning. For most of these decades, state and national economies grew rapidly, and resources for education from both state and federal sources expanded to an all time high. Government policies sought to expand opportunities for education and training first to returning veterans and then to their children. As the offspring from the post-war "baby-boom" began to reach college age, colleges and universities across the country rapidly expanded their physical plants to accommodate them. Because academic facilities needed to be doubled within a decade, new campuses and buildings were hastily constructed--sometimes with little consideration for specific educational needs, quality of materials, energy conservation, or physical access and with even less realization of the future fiscal liability that these new facilities would create.

CONSTRAINTS OF THE '70s AND '80s

The 1970s brought substantial changes in both the fiscal condition and the educational programs of higher education. In the 1970s, both enrollments and fiscal resources continued to grow, but inflation and energy costs consumed an ever-increasing portion of these resources. Colleges and universities began to experience a cost-revenue squeeze, and for many, this squeeze occurred sooner than their leaders expected, often leaving them with unrealized and perhaps even unrealistic aspirations.

Because many leaders hoped that the squeeze would be short term, they responded with "temporary" measures rather than reviewing the long-term costs and benefits. They delayed library and equipment purchases and deferred the

renovation of buildings and certain maintenance activities with the intention of recouping this underfunding in the near future. However, as costs spiralled upward and the growth rate of enrollment and resources slowed, they experienced increasing difficulty in meeting even existing program obligations, much less compensating for past deferrals.

By 1980, higher education facilities covered 2.2 billion gross square feet and had a replacement value of approximately $200 billion--more than double that of 25 years earlier (National Center for Education Statistics, 1982). This increase in the size and value of the physical plant as well as the likelihood that 85 percent of the campus facilities in use in the year 2000 already exist have substantial implications for future capital outlay needs as the plant ages, deteriorates, and becomes outmoded, and as revenues grow more slowly and costs increase more rapidly than anticipated when construction was undertaken. Projects that promise payback either in increased enrollments or reduced operating costs or that are eligible for partial federal financing are more likely to receive high priority than facilities maintenance and renewal that merely preserve what already exists (Halpern, 1982). In fact, maintenance of facilities has been one of the first areas where institutional leaders and State policy makers have reduced budget requests and imposed budget reductions during fiscal stringency. As a result, a backlog of maintenance projects developed that must compete with emergency repairs for the limited funding available (Kaiser, 1979).

Institutional leaders have recognized the dangers of deferral, even if they have been unable to avoid it. For example, as early as 1950, Walter Kraft stated that "in many instances, buildings have been permitted to deteriorate to the point at which the repair item becomes a remodeling item. This places a great burden on the budget, is wasteful, and may encroach upon the instructional program."

Since then, administrators and board members of private colleges and universities, highly dependent on tuition for all institutional expenses, have most commonly had to confront this dilemma. In terms of financial health, Cheit (1971) found more private than public institutions were in financial distress. But by 1980, public institutions also began to suffer the effects of delayed maintenance. Leaking roofs, broken windows, peeling paint, and threadbare carpets offered tangible evidence of delay. In that year, the Association of Physical Plant Administrators estimated that the cost of maintaining and operating a college campus had doubled over the preceding decade, while maintenance expenditures had risen by only 1.8 percentage points--from 10.6 to 12.4 percent of total expenditures. Worse, the share of facilities budgets available for repairs had been cut more than in half--from 8.4 to 4.0 percent.

Students of educational finance, such as Hans Jenny, Howard Bowen, and John Minter claim that the one area of cost not adequately represented in the financial data of higher education is the depreciation of capital assets--the slow but inexorable using up of institutional capital. While no statistics exist to estimate the number of dollars needed to bring the physical assets of higher education up to par, according to Jenny and others (1982) even a modest charge for a renewal and replacement reserve, such as 1.5 percent of plant assets, would now push 80 percent of American institutions into a deficit. Although insufficient funds are the most often cited reason

for no maintenance reserves and, thereby, the steadily escalating maintenance backlog, this lack of funds is also a function of institutional priorities that can be changed and may not take into account the contribution that facilities make to the attainment of institutional mission (Zachar, 1980). Higher education policy makers have shown increasing concern about facilities maintenance problems and several national task forces are addressing these issues.

TWO

FACILITIES MAINTENANCE IN CALIFORNIA PUBLIC HIGHER EDUCATION

From its earliest days as a state, California has valued education and invested heavily in its higher education institutions. For decades, it has provided the most diverse educational opportunities in the nation in terms of both programs and locations of institutions. It responded to the challenges of post-war growth with a major statewide effort climaxed by the 1960 Master Plan for Higher Education that the Legislature commissioned to assure "the development, expansion, and integration of the facilities, curriculum, and standards of higher education" in the State through 1975.

In the area of facilities, the Master Plan Survey Team reviewed the current capacity and utilization of the physical plants of the State's 60 public junior colleges, ten State Colleges, and six University of California campuses, as well as the need for additional institutions based on projections of high school graduates by geographical region. They recommended the development of 22 new junior colleges, two new State Colleges, the three already-approved new campuses of the University of California, and consideration of five more State Colleges after 1965. By 1970, the University and State University had established their current complement of nine and 19 campuses, respectively, while 91 of today's 106 Community Colleges were in operation.

Into the 1980s, California's colleges and universities enjoyed an enviable position relative to that of other states because California's economic slowdown occurred later than elsewhere and for a variety of reasons enrollments remained high. Although no new public four-year campuses were established, 15 new Community Colleges were created between 1970 and 1980, and most existing campuses in all segments expanded their facilities considerably. By June 1980, its replacement value, exclusive of property value and equipment, was $7 billion--a substantial capital asset with concomitant long-run fiscal responsibility for the State as it entered a decade projected to be one of "reduction, reallocation, and retrenchment" (Mortimer and Tierney, 1979).

By 1981, California's cost-revenue squeeze, while somewhat milder than elsewhere, was also evident, stemming both from inflation and the so-called "taxpayers' revolt" epitomized by Proposition 13. Academic and public policy makers instituted many of the measures common in other states to reduce costs and enhance revenues. They realized the implications of deferring maintenance for the current and future condition of both educational facilities and the programs they house. They also recognized the need to examine the long-term costs of deferral, work cooperatively on solutions, and plan for a less affluent future. But they deferred maintenance obligations because of insufficient funding and/or shifting priorities for existing funds.

While the rate of inflation has slowed recently, economic stagnation has limited public support available for higher education. Reductions in baseline budgets have been followed by further, mid-year, budget reductions. Salaries and fixed costs have consumed a greater proportion of budgeted funds, and previously deferred items have been deferred again. At the same time, the growth of high-technology and information-based industry has created added demands on physical plant and related changes in student program demand have increased the need for a different type of laboratory facilities. This has expanded the discussion of facilities maintenance to include consideration of the tradeoffs among repair, renovation, and replacement for the efficient use of fiscal resources and for optimum program effectiveness because State funding for both deferred maintenance and capital renovation comes from the same fund source. With fiscal resources severely constrained, these tradeoffs are not simple. They involve reallocation of resources among existing programs to assure maintenance of program quality, recapture institutional flexibility, and implement those priorities which enhance both short- and long-term productivity.

Comprehensive consideration of these issues in California public higher education is complicated by the fact that budget allocations for facilities maintenance at the University of California and the California State University are in two separate categories--current facilities maintenance and deferred maintenance--and the Community Colleges now receive a separate appropriation for deferred maintenance apart from their general apportionments to districts which include support for current plant maintenance. Facilities maintenance should be viewed as a single issue in planning and budgeting, but California's ever-increasing backlog of maintenance needs stems in part from inadequacies in the concept and application of current facilities maintenance. To understand how this backlog may someday be resolved, one must understand how it developed. This requires looking at the two pieces--current facilities maintenance and deferred maintenance.

CURRENT FACILITIES MAINTENANCE

Maintenance of the physical plant has always been considered a basic activity within higher education administration. For example, the University of California defines maintenance as those "routine or recurring activities the purpose of which is to keep facilities and systems functional," and includes within it:

> the preservation of improvements and their components such as elevators, boilers, refrigerators, air conditioners, and other equipment which is part of a structure, and repair and replacement of floors, walls, windows, . . . electrical, mechanical and plumbing equipment and fixtures. Exterior and interior painting of existing structures are forms of maintenance. (1979, p. B-3.5)

This definition, which implicitly includes preventive, routine, and emergency maintenance, provides a framework for discussing facilities maintenance in all three segments of California public higher education.

In two of the segments--the University and State University--funding for current facilities maintenance is formula based, with the major operational factor in the formula being square footage. At the University, the budget category of Operation and Maintenance of Plant includes utilities, janitorial services, refuse disposal, and fire protection along with their administrative and support services, as well as buildings and grounds maintenance. At the State University, Physical Plant Operations is a budgetary subcategory of Institutional Support. While the Governor's Budget does not detail physical plant expenditures by its components, the subcategory of Physical Plant Operations includes support for maintenance of buildings, grounds, and electrical and mechanical systems as well as janitorial services, utilities, fire protection equipment, and waste disposal.

Because these funding configurations differ from the Community Colleges, the funding histories of all three segments are discussed separately below. As these histories will show, the development and response of the segments to their facilities maintenance problems have also differed. Because of these differences, comparisons among the segmental data are not likely to be instructive.

Current Facilities Maintenance at the University of California

At the University of California, expenditures for Operation and Maintenance of Plant (OMP) have comprised a fairly constant proportion of its overall budget since at least 1968-69. Table 1 compares its total institutional program expenditures with total OMP program expenditures from 1972-73 to 1982-83. As can be seen, resources available for the operation and maintenance of the University's physical plant appear to have kept pace with its overall ability to fund its activities, ranging over these years between 5.8 and 6.6 percent of its budget. However, total appropriation levels for OMP do not reflect the different trends in funding program categories within OMP as Table 2 shows. It breaks down total OMP expenditures into three categories--current maintenance, utilities, and other related costs--and indicates their relative share of total OMP expenditures. In 1972-73, the OMP budget was nearly equally distributed among these three categories but by 1981-82 utilities consumed almost half of it, and for 1982-83 their share is estimated to be over half. Meanwhile, current maintenance dropped from 34 to 22 percent. Total OMP expenditures over this period grew approximately 15 percent a year, but utilities costs rose by an average of nearly 23 percent a year while current maintenance increased by an average of 10.4 percent.

TABLE 1 University of California Program Expenditures for Operation and Maintenance of Plant (OMP) Compared to Total Institutional Program Expenditures, in Thousands of Dollars, 1972-73 to 1982-83

Fiscal Year	Institutional Program Expenditures	OMP Program Expenditures	OMP as a Percent of Total
1972-73	$ 664,182	$ 40,528	6.1%
1973-74	783,813	45,317	5.8
1974-75	929,540	56,030	6.0
1975-76	1,064,111	63,278	5.9
1976-77	1,247,684	73,957	5.9
1977-78	1,359,196	85,140	6.3
1978-79	1,466,706	87,973	6.0
1979-80	1,727,532	105,385	6.1
1980-81	2,098,357	132,048	6.3
1981-82	2,274,868	149,013	6.6
1982-83*	2,431,038	162,111	6.6

*Budgeted

Source: Governor's Budget, various years.

TABLE 2 University of California Expenditures for Operation and Maintenance of Plant (OMP) by Subcategories, in Thousands of Dollars, 1972-73 to 1982-83

Fiscal Year	Current Maintenance		Utilities Costs		Other Related OMP Costs	
	Amount	% of OMP	Total	% of OMP	Total	% of OMP
1972-73	$13,836	34%	$13,331	33%	$13,361	33%
1973-74	15,684	35	15,277	34	14,356	31
1974-75	17,538	31	20,341	36	18,151	33
1975-76	18,864	30	24,830	39	19,584	31
1976-77	20,717	28	30,640	41	22,600	31
1977-78	23,998	28	37,244	44	23,898	28
1978-79	23,306	27	39,949	45	24,718	28
1979-80	29,305	28	49,346	47	26,734	25
1980-81	31,270	24	55,509	42	45,269	34
1981-82	34,713	23	73,225	49	41,075	28
1982-83*	36,272	22	83,305	51	52,534	32

*Budgeted

Source: Governor's Budgets, various years.

The University estimates its maintenance funding needs on the basis of its Building Maintenance Budget Standard. This Standard, which has been part of University policies and procedures since 1972, includes 190 workload units with their respective service cycles which are in a range from 1 to 50 years. Maintenance costs are related to the present replacement value (PRV) of the physical plant and to the average age of the facilities. This procedure calculates an annual funding level of 1.3 percent of PRV as necessary to maintain and preserve the physical plant in original condition--a percentage approximating maintenance funding levels recommended in the national literature. This Standard allows roughly 60 percent for preventive maintenance, 35 percent for periodic replacement of structural components and fixed equipment such as roofs and boilers, and only 5 percent for unscheduled (or breakdown) maintenance, assumes that the physical plant is starting out in optimum condition.

For a number of years in the late 1970s, the University contended that State funding for OMP averaged 58 percent of optimum, and was below the level provided other State agencies. The University's estimated aggregate annual deficit now exceeds $24 million. This chronic funding deficit, it claimed, failed to provide adequate resources to support an effective preventive maintenance program, and had increased the incidence of emergency repairs whose costs consumed 60 percent of budgeted resources. Programmed replacement of structural components and major building equipment had largely been ignored, and the backlog of maintenance needs had continued to grow.

In his Analysis of the 1979-80 Budget Bill, the Legislative Analyst called for a study of OMP funding. In a supplemental analysis, he confirmed that the square footage support basis for the University was below that for other State agencies. In 1980-81, the Legislature approved a $3 million augmentation--$2 million for building maintenance and $1 million for janitorial services. The University expressed its intention to utilize this increase almost exclusively to accelerate preventive maintenance. Since that time, the University has requested additional augmentations to ameliorate the continuing deficiency between the level of current funding and its Building Maintenance Budget Standard, but such augmentations have not been approved.

A final issue of current facilities maintenance at the University involves the source of funding. The University asserts that the maintenance of buildings which serve the academic instructional mission of the University is fundamentally the responsibility of the State, and indeed the State provides over 90 percent of the resources needed for OMP. Between 1980-81 and 1981-82, the traditional level of State General Fund support for OMP decreased and support for OMP derived from Restricted Funds increased from $6.225 million to $14.172 million. These funds were applied to OMP costs related to Student Services facilities. In 1982-83, an additional $5.4 million of Educational Fee revenues replaced State General Fund support of OMP costs related to student services. The 1983-84 Governor's Budget proposes to shift another half-million dollars of these costs from General Fund to student fee support.

Current Facilities Maintenance at The California State University

At The California State University, expenditures for Physical Plant Operations (PPO) grew from 7.5 percent of total institutional expenditures in 1972-73 to 8.8 percent in 1981-82 and are likely to constitute 9.1 percent of total expenditures this fiscal year. Table 3 compares PPO program expenditures with total institutional program expenditures over this period. Because of the differences in segmental missions and the higher costs associated with such programs as research and health science, intersegmental comparisons are not pertinent.

Appropriations for physical plant maintenance at the State University are determined by funding formulas based on adjusted gross square footage and other secondary factors. While these resources seemed sufficient to cover routine maintenance, some administrators have been concerned that certain maintenance activities were being neglected because, by their nature or by the level of funding, resources were not available for them. In 1978-79, at the request of the Chancellor's Office, the campuses prepared a list of their maintenance and repair needs. The cost to eliminate this backlog of maintenance problems was estimated to be $7 million. The list had ramifications for subsequent current maintenance efforts. The Legislative Analyst

TABLE 3 California State University Program Expenditures for Physical Plant Operations (PPO) Compared to Total Institutional Program Expenditures, in Thousands of Dollars, 1972-73 to 1982-83

Fiscal Year	Institutional Program Expenditures	PPO Program Expenditures	PPO as Precent of Total
1972-73	$ 553,428	$ 41,889	7.5%
1973-74	613,991	47,754	7.8
1974-75	689,672	56,800	8.2
1975-76	775,302	62,567	8.1
1976-77	879,575	73,174	8.3
1977-78	969,171	82,060	8.5
1978-79	1,006,875	84,634	8.4
1979-80	1,182,088	96,058	8.1
1980-81	1,392,982	122,252	8.7
1981-82	1,437,771	127,314	8.8
1982-83[a]	1,462,289	133,314	9.1

a. Budgeted

Source: Governor's Budget, various years.

commented on it in his Analysis of the 1979-80 Budget Bill. Acknowledging the need "to protect the substantial public investment represented by existing CSUC facilities," he contended that this protection should be accomplished by establishing a statewide comprehensive preventive maintenance program. In Supplemental Language to the 1979-80 Budget Act, the Legislature directed the State University to implement a preventive maintenance program on each campus, with the objective of reducing the incidence and cost of emergency maintenance by anticipating and evaluating the need for repairs and their cost. This directive has impelled the reorganization of all maintenance efforts at the State University. The State University has complied with this directive by redirecting existing PPO resources.

In 1979-80, the State University formed a systemwide Task Force and established a pilot project. By November 1980, the Task Force had drafted a Planned/Programmed Maintenance Manual to guide the development of campus preventive maintenance programs. The manual defines planned maintenance as a "systematic, day-to-day process funded by the annual operating budget to control deterioration of colleges or university physical facilities: e.g., structures, systems, equipment, pavement, and grounds" (p. 1).

"Planned maintenance" thus includes routine repetitive work, such as housekeeping, and building and grounds maintenance; preventive efforts, such as inspection, adjustment, cleaning, and minor repair of equipment; and routine calls for service. In effect, it is current facilities maintenance managed with systematic, computer-assisted techniques. ("Programmed maintenance," which addresses traditional deferred maintenance concerns, is discussed later in this paper.)

Currently, the sources of support for Physical Plant Operations of the State University are shifting. Table 4 displays levels of PPO support by source of funds for 1981-82 (actual expenditures), 1982-83 (budgeted expenditures), and 1983-84 (Governor's proposal). Because the current Governor's Budget is the first one to identify PPO funding sources, earlier information about proportional support by source is not available. However, between 1976-77 and 1980-81, reimbursements averaged about 6 percent of all Institutional Support expenditures. As Table 4 shows for PPO, they jumped to 15.5 percent in 1982-83 and are proposed to reach 40.2 percent in 1983-84, while General Fund support has decreased proportionally.

Student fee revenues are the major component of these reimbursements, and they are the primary source of revenue for support of student services. In 1982-83, the State imposed an annual fee increase of $225 on State University students, the revenues from which are general reimbursements to the State. Because student fee revenues cannot be applied to the instructional components of the budget, they were offsets to Institutional Support, and a like amount of General Fund support was transferred to the instructional program. In this year, the only budget category to show any major change in source of funding was Institutional Support--reimbursements more than doubled (replacing State General Funds) and their share of program costs increased from 11 percent to 22.8 percent. The 1983-84 Governor's Budget proposes to extend and accelerate this trend by increasing the annual State University Fee by $230 over its 1982-83 level and shifting additional Institutional Support costs from General Funds to student fee support. Reimbursements'

share of support for physical plant operation would increase to over 40 percent of total program expenditures in 1983-84.

Current Facilities Maintenance at the California Community Colleges

In the California Community Colleges, support for facilities maintenance is included in State general apportionments that are based on average daily attendance (ADA). While Community Colleges are primarily instructional facilities, the relationship between ADA and the size and maintenance needs of their physical plants is not clear. But economies (or more accurately diseconomies) of scale do exist and the small district factor, which raises average support level somewhat, recognizes the higher average fixed costs, such as providing and maintaining adequate facilities, of smaller institutions. The actual distribution of apportionments among budgetary categories within the districts is governed by local boards and their administrative policies and procedures. The major statewide constraint on district expenditures is that at least 50 percent of their current expenditures for education (CEE) must be allocated for instructional salaries.

While historical data on support for Community College facilities maintenance either statewide or by district is not available, several facts suggest that their facilities maintenance problems are equal to or greater than

TABLE 4 California State University Support for Physical Plant Operations (PPO) by Source of Funds, in Thousands of Dollars, 1981-82 to 1983-84

Sources of Funds	1981-82[a] Amount	% of Total	1982-83[b] Amount	% of Total	1983-84[c] Amount	% of Total
Total	$127,314	100.0%	$133,272	100.0%	$142,735	100.0%
State[d]	107,826	84.7	99,797	74.9	70,823	49.6
Reimbursements	8,081	6.3	20,633	15.5	57,402	40.2
Auxiliary Enterprises User Fees[e]	11,407	9.0	12,842	9.6	14,510	10.2

a. Actual expenditures.
b. Budgeted expenditures.
c. Proposed expenditures.
d. Includes General Fund, Capital Outlay Fund for Public Higher Education, and Energy and Resources Fund.
e. Includes Parking Account, Dormitory Revenue Account, and Continuing Education Revenue Fund.

Source: Governor's Budget, 1983-84.

those experienced by the University and State University. Community Colleges grew from 60 in 1957 to 106 in 1983 with hundreds of off-campus centers. While many built new campuses, a number found themselves in retreaded high school or college campuses. Los Angeles City College, for example, occupies the original site of UCLA. More recently, they have faced the same cost-revenue squeeze as their four-year counterparts. The restriction on use of resources for instructional salaries and the demand for student support services in addition to inflation and rapidly increasing energy costs have adversely affected their resources available for routine maintenance and repair and cyclic replacement of building components and systems.

DEFERRED MAINTENANCE

In many ways, California public higher education provides a classic illustration of the evolution of the facilities maintenance dilemma currently facing all institutions. Over a period of years, through both internal reallocation and underfunding of regular plant maintenance, a backlog of maintenance needs developed. While current facilities maintenance funding formulas vary by segment, all of them include provisions to meet regular or routine maintenance needs. At the University, they include reserves to cover maintenance needs whose repair cycle exceeded one budgetary period while at the State University these maintenance needs receive funding through a separate budget category--Special Repair. None of these formulas include a reserve to compensate for needs neglected in earlier periods. A backlog of maintenance needs developed for a variety of reasons including inadequate current maintenance funding, use of maintenance funds for other institutional priorities, and/or inadequate maintenance procedures. Preventive maintenance programs which assumed optimum facility conditions were instituted after the backlog had developed and at a time when emergency or breakdown repair consumed more than half of all funds allocated to maintenance. Thus as the physical plant aged, the backlog grew; and eventually the segments sought, and the State appropriated, separate funds to attack the backlog.

Like funding for current maintenance, the timing and structure of this "deferred maintenance" funding is sufficiently different among California's three segments to warrant separate segment-by-segment discussion.

Deferred Maintenance at the University of California

The University first measured its backlog of facilities maintenance needs in 1968. At that time, it estimated that the backlog was over $5 million and was growing at the rate of approximately 12 percent a year. The University thereupon established a "deferred maintenance program," the policies and procedures of which were first stated in a series of administrative memos between 1970 and 1972. A 1971 memo defined deferred maintenance projects as "those maintenance projects of a non-capital nature (related to the State funded maintenance of physical plant) which have not been completed as scheduled because of a lack of budgeted operating funds" (Vice President for Physical Planning, 1971, p. 1).

This definition was subsequently clarified in a February 1972 memo by Vice President McCorkle:

> An item of maintenance becomes deferred when not completed within the corresponding service cycle listed in the Building Maintenance Budget Standard, or after an unexpected health or safety hazard develops; because it cannot be funded by the campus out of that year's building maintenance budget.

The University has since developed a decentralized approach to deferred maintenance. Systemwide Administration has established general procedures for identifying deferred maintenance projects which rely on the expertise of outside consultants and campus physical plant personnel. These procedures clearly distinguish between projects which are alteration and those which are maintenance, or renewal and renovation. The cost of a project does not affect its determination as a deferred maintenance item. Each project should stand on its own merits and multiple-phase, interdependent projects are not encouraged. Campuses supply their lists of projects in priority order to Systemwide Administration which consolidates them into a report to the Joint Legislative Budget Committee. This report is the official University of California Deferred Maintenance Backlog list. Once campuses receive their deferred maintenance allocations, expeditious project completion is required because these funds are available for only 15 months.

The State first agreed to assist the University with the reduction of the backlog of untended maintenance in 1969. Each year from 1969 to 1972, the Legislature allocated $500,000 of General Funds to be matched by an equal amount of Regents' funds for deferred maintenance. Table 5 provides a ten-year history of changes in the estimated cost of University-approved deferred maintenance projects and budgeted expenditures for them by funding source. Between 1973-74 and 1975-76, the University added $1.5 million from Educational Fee revenue in an effort to reduce the maintenance backlog still further. In 1976, however, the Regents established the policy that all Educational Fee revenues would be dedicated to student financial aid and related costs. The Regents replaced this fee revenue with additional Regents' Opportunity Funds. In 1976, the source of State funding also changed, with General Fund revenues replaced by Capital Outlay Funds for Public Higher Education (COPHE), a Tideland Oil Revenue account.

In 1978-79, federal funding for maintenance activities became available through Title II of the federal Public Works Employment Act of 1976. These funds were restricted to labor costs, which comprise approximately 60 percent of maintenance jobs. Thus, with $2 million for nonlabor costs, the University qualified for $5 million of federal assistance. Over the subsequent two and one-half years, the University received approximately $9 million in federal funds matched with $5 million of its own funds. During this period, the State did not contribute any resources toward deferred maintenance at the University.

When federal funding ended and State support was not budgeted in 1979, the University found it necessary to identify additional funds to cover emergency repairs for the 1979-80 fiscal year. The loss of federal funding, the need for emergency repair funding, and the continuing escalation of the

TABLE 5 University of California Approved Deferred Maintenance Projects and Budgeted Expenditures by Source of Funds, in Thousands of Dollars, 1972-73 to 1982-83

Fiscal Year	Estimated Cost of Projects	Budgeted Expenditures: University		State		Federal
		Regents' Funds	Educational Fee	General Fund	COFPHE	Title II[a]
1972-73	$ 6,000	$ 500	0	$ 500	0	0
1973-74	7,897	500	$1,500	500	0	0
1974-75	10,500	500	1,500	500	0	
1975-76	16,000	500	1,500	500	0	0
1976-77	17,400	2,000	0	0	$ 500	0
1977-78	24,400	2,000	0	0	0	$ 5,000
1978-79	25,200	3,000	0	0	0	3,000
1979-80	28,200	2,000	0	0	0	0
1980-81	36,100	2,400	0	0	5,000	800
1981-82	40,000	2,000	0	0	4,720	0
1982-83	50,000	2,000	0	0	5,082	0

a. Public Works Employment Act of 1976

Source: University of California Budget for Current Operations and for Capital Improvements; Governor's Budget various years.

value of the maintenance backlog proved sufficient justification for the appropriation of $5 million from COPHE in the 1980-81 Budget. Despite continuing State and Regents' support at a level of nearly $7 million a year since 1980, the backlog of identified maintenance projects has continued to grow at the approximate rate of 25 percent a year.

By University standards, neither current maintenance nor deferred maintenance appropriations are keeping pace with maintenance requirements. Annual building maintenance budgets are insufficient to cover all current maintenance needs, and thus more items are continually added to the maintenance backlog. Since "deferred maintenance" appropriations are less than the estimated value of the backlog, those backlogged items which cannot be funded become increasingly costly due to inflation and further deterioration.

Deferred Maintenance at The California State University

At the State University, "Special Repair" is the term applied to projects which, if not funded, will become deferred maintenance. These projects involve maintenance of facilities and their components with maintenance cycles

greater than one budget cycle. Up to 1978-79, funding for Special Repair was part of Minor Capital Outlay appropriations. At that time, State policy makers decided that Special Repairs was a maintenance activity and its appropriations should be part of the current operations budget and not the capital outlay account.

At this same time, the Chancellor's Office requested that campuses identify and estimate the cost of their unmet maintenance needs. This survey revealed that the backlog of needs exceeded $7 million. The Trustees then proposed a multi-year program to reduce and, eventually, eliminate this backlog. Table 6 shows the amount of the backlog and State appropriations for Special Repair from 1978-79 to 1982-83. In the first two of the five years, because of the small amount of funding, funds were not allocated to campuses for their deferred maintenance projects but were applied only to emergency repairs. In 1978-79, federal Title II funds provided support for the more critical deferred maintenance projects.

As mentioned earlier, in 1979 the Legislative Analyst recommended that the State University develop a comprehensive preventive maintenance program. The Chancellor's Task Force on Facilities Maintenance, in its November 1980 report, recommended a comprehensive program of "Planned/Programmed Maintenance." The "planned maintenance" portion is designed to prevent further growth in the maintenance backlog. The "programmed maintenance" portion of this program sought to provide "a systematic management process to plan and budget for known future cyclic repair and replacement requirements which extend the life and retain usable condition of campus facilities and systems and are not normally contained in the annual operating budget" (Appendix B, p. 2; underlining added).

This portion of the program seeks to identify, schedule, and budget for special repair and major emergency maintenance in such a way as to limit, if not eliminate, the maintenance backlog.

TABLE 6 California State University Backlog of Maintenance Projects and State Special Repair Expenditures, in Thousands of Dollars, 1978-79 to 1982-83

Fiscal Year	Estimated Cost of Projects	Special Repair Expenditures
1978-79	$ 7,000	$ 250
1979-80	5,000	500
1980-81	9,000	3,234
1981-82	11,500	1,678
1982-83	16,000	5,452*
1983-84	38,400	5,725**

*Budgeted

**Proposed

Source: Governor's Budget, various years, and California State University Support Budget, various years.

The Planned/Programmed Maintenance Manual differentiates between "special repair" and "deferred maintenance," with deferred maintenance being those special repair projects which are not funded because of low priority or insufficient funds. Setting priorities among special repair projects thus becomes a crucial decision in deferral. Planned/Programmed Maintenance provides for developing five-year projections of cyclic maintenance, establishing campus maintenance standards, thorough inspecting and documenting of needs, determining the nature and cost of corrective actions, and setting clear priorities among projects. Nonetheless, it is possible under Programmed Maintenance for special repair and major emergency maintenance to be fully funded while the deferred maintenance backlog continues to grow. However, its objective is to set priorities so that less critical and low-cost projects are deferred, while high priority items are remedied in a timely manner.

In April 1981, through Executive Order 343, the Chancellor of the State University directed each campus to initiate its own Planned/Programmed Maintenance program. While the order allows campuses some flexibility, their programs are required to include among other elements:

- a current annual and five-year projection of special repair projects in priority order,
- a current annual listing of unfunded deferred maintenance projects, and
- a current annual listing of major equipment programmed for replacement.

In his November 1981 report to the Joint Legislative Budget Committee, the Chancellor stated that the campuses were progressing well on their planned (or current) maintenance programs and as those became operational, attention would shift to development and implementation of the programmed maintenance portion of the program.

The Chancellor's November 1982 report highlighted several changes in the process of developing Special Repair funding requests in hopes of improving appropriations levels:

- The first was certification by the campus administrator responsible for physical plant that each requested project met the Special Repair criteria and merited funding.
- Second, each request was then reviewed and recertified by the Vice Chancellor of Budget Planning.
- Third, a team of senior plant operation personnel conducted on-site inspections of all projects and assigned priorities to them in light of systemwide criteria. Through these procedures, the most critical $10 million of both Special Repair and deferred maintenance projects were identified and submitted to the Department of Finance with back-up data. The 1983-84 Governor's Budget proposes $5.725 million for these projects.

Deferred Maintenance at the California Community Colleges

Prior to the passage of Proposition 13 in 1978, California's Community Colleges could raise needed revenues for facilities maintenance through local taxes. Proposition 13 severely restricted the ability of districts to raise new revenues and shifted major responsibility for Community College support to the State. This shift of responsibility required new State funding mechanisms that would provide guidelines for distributing funds as well as accountability standards for assuring their proper use. These new mechanisms and related administrative procedures for support of deferred maintenance evolved slowly.

By 1980, the cost of Community College deferred maintenance needs, as evidenced by districts' Five-Year Capital Outlay Construction Plans, totaled $19 million. That year, the Legislature appropriated $125 million of COPHE monies for capital outlay needs of all three public segments of higher education, and it included performance of deferred maintenance activities within its definition of construction. The Governor proposed that $3.18 million of these funds and $5 million from the General Fund be used during 1981-82 for Community College deferred maintenance. By then, Community College deferred maintenance needs stood at $33.6 million and were projected to increase to $77.2 million by 1986-87. Nonetheless, the Legislative Analyst recommended that the proposed $8.18 million be deleted because there were (1) no plan for the expenditure, (2) no systematic assessment of need, (3) no system to determine funding priorities, and (4) no authority by the State to require districts to maintain their current level of local support for deferred maintenance. The 1981-82 Budget Conference Committee eliminated these funds from the Community College budget.

Subsequently, existing fiscal legislation (SB 841-Alquist) was amended to include administrative provision which addressed the Legislative Analyst's concerns and permit districts to qualify for deferred maintenance funding. Even though appropriations were also deleted from this legislation, it created the policy and procedural basis for State support of deferred maintenance costs at the Community Colleges to "ensure that public community college facilities are repaired and maintained on a timely basis in order to provide for safe utilization of these facilities as well as providing for the prevention of further structural damage resulting in more costly repair" (Chapter 764, Statutes of 1981 (SB 841).

SB 841 defined "deferred maintenance and special repair" to be "unusual, nonrecurring work to restore a facility to safe and continually usable condition for which it was intended." It set the following restrictions on funding:

1. The Board of Governors had to adopt rules and regulations for the allocation of funds appropriated.

2. These procedures had to establish criteria for district and statewide ranking of projects.

3. Districts had to develop and submit a five-year maintenance plan including preventive as well as deferred maintenance.

4. Districts had to match State funds with an equal amount of their own funds, but complete or partial waivers could be granted by the Board of Governors after review of the financial condition of the district.

5. Districts had to spend at least 0.5 percent of their current operating budget on current maintenance.

6. State funds were to supplement, not supplant, district deferred maintenance funds.

In 1982, the Board of Governors responded to these provisions by adopting Title 5 Administrative Code regulations implementing the Community Colleges Facility Deferred Maintenance and Special Repair Program, and the Chancellor's Office identified five categories of deferred maintenance and special repair projects as (1) roof repair and replacement, (2) mechanical equipment repair and replacement, (3) utility repair and replacement, (4) exterior refinishing and repair, and (5) other critical maintenance needs. The Chancellor's Office also defined three categories or levels of need:

- Acute: A very serious condition requiring immediate attention to avoid loss/increased costs to a facility or major equipment, or curtailment of an essential program or function.

- Urgent: A maintenance need of some urgency, but which could, if necessary, be delayed a year or more without affecting essential programs or functions.

- Routine: A maintenance need which the district would normally repair or replace within the next five years.

In February 1981 and again in February 1982, the Chancellor's Office asked the districts to identify their deferred maintenance needs by type of project and level of need. This process identified, and reordered by statewide priority, $26.6 million worth of needed maintenance projects for which the Board of Governors, in their 1982-83 Budget, requested $13.3 million in State General Fund support for the State's share of the program. The Department of Finance reduced this amount to $6 million and substituted funds from COPHE. Despite substantial budget cuts during the 1982-83 Budget deliberations, this allocation survived intact and in July 1982 the Chancellor's Office authorized districts to proceed with their priority projects and to submit claims for project costs in accordance with standard contract regulations.

While the 1983-84 Governor's Budget proposes to continue this program with an equal appropriation, the Governor's Executive Order of January 21, 1983, may curtail remaining current year funds for deferred maintenance. This Executive Order requires all Local Assistance capital outlay funds, of which the deferred maintenance allocations are a part, not currently under contract to revert to the State. The Chancellor's Office argues that the agreement to match district funds has encumbered those monies, and the Department of Finance is reviewing this situation.

SUMMARY

Approaches to facilities maintenance have differed among the three segments of California public higher education. One segment, the University of California, has been receiving State support for deferred maintenance since 1969, while the Community Colleges first received such support less than a year ago. The University of California has taken a decentralized approach to the problem, allowing each campus to develop its own administrative and procedural framework and resolve its problems within the broad policy and budgetary guidelines of Systemwide Administration. In contrast, the State University is implementing a comprehensive systemwide program of facilities maintenance management for which the Chancellor's Office is providing training, computer software and hardware, and standardized procedures for campus Planned/Programmed Maintenance. The Community Colleges, because of their diverse and independent nature, are receiving general guidance and assistance from their Chancellor's Office regarding current and deferred maintenance.

Despite this diversity, some elements of facilities maintenance are common throughout California public higher education. In spite of different titles and slightly different components for their current operating budgets for facilities maintenance, all three segments have experienced shrinking revenues and increasing operating costs. The effects of this revenue-cost squeeze are increasingly visible, and since maintenance needs have outstripped available funds--either because maintenance is a low institutional priority or because of insufficient funds--the backlog of these needs has continued to grow. In 1982-83, the segments are allocating over $22 million toward the backlog, but by now the identified backlog amounts to nearly $100 million, having increased annually by more than 25 percent in recent years.

The appropriation category established to provide funds for reducing this backlog is "deferred maintenance" in the University, "special repair" in the State University, and "deferred maintenance and special repair" in the Community Colleges. The latter term recognizes the distinctive nature of these two maintenance categories. While separate funding may not be necessary for each of them, they may require separate strategies in planning and budgeting. "Special repair" is a more accurate description than "deferred maintenance" for major nonrecurring maintenance or replacement operations that occur on a time schedule of more than one budget cycle but that are routine and can be planned for. This allows the term "deferred maintenance" to be reserved for those routine maintenance needs--whether on an annual or longer repair cycle--that are delayed because of low priority or insufficient funds. Under these definitions, special repair should be a regular part of institutional planning and budgeting, while deferred maintenance is a symptom of inadequate planning and budgeting that may threaten institutional viability and educational quality. Reducing and eliminating the backlog of deferred maintenance should thus be a goal of public higher education policy makers at all levels--institutional, segmental, and statewide.

THREE

CONCLUSIONS

California has entered a period of fiscal stringency that requires a thorough reassessment of State and segmental priorities, including the role of facilities in the mission of higher education. The major challenge in the next 20 years will be to find sufficient resources to "survive, to maintain, and to plan ahead" (Fink, 1980, p. 11). Protection against excess plant deterioration is, of course, only one of the physical capital problems that will face higher education in these decades. Energy conservation, equipment replacement, compliance with new State and federal code regulations, and remodeling, renovating, and retrofitting buildings to fit changing program needs will be other priorities. But if the educational mission and quality of program of these institutions are to be protected, the role of facilities maintenance must receive adequate recognition. Decisions regarding facilities maintenance will be most effective if they are made within the context of the educational process, and if decision makers at all levels recognize the dependence of the educational process on adequate educational facilities.

Several recent events suggest that California policy makers recognize their responsibility to maintain the physical plant of public higher education for future generations of students:

- In making major cuts to the 1982-83 Governor's Budget, the Legislature did not directly reduce the deferred maintenance budgets of any of the segments, and the 1983-84 Governor's Budget proposes to fund these categories at or above their 1982-83 budgeted level.

- In the summer of 1982, legislation was introduced to transfer all allocations for higher education deferred maintenance to critically needed support for elementary and secondary school education, but this legislation did not pass for numerous reasons, including recognition that these funds would be only a small gain for the schools but are imperative for higher education facilities maintenance.

- Among institutional policy makers, President Saxon made a major presentation to the University of California Regents on the issue of capital needs, including maintenance.

- The Planned/Programmed Maintenance program of the State University is a comprehensive approach to facilities maintenance that emphasizes greater efficiency in all maintenance activities and more preventive maintenance to reduce and eliminate its maintenance backlog.

- Campus task forces on facilities planning and maintenance are increasingly involving academic as well as business and physical plant decision makers.

While recognition of the facilities maintenance dilemma has increased, it remains unresolved. Despite large appropriations to these maintenance accounts, the backlog continues to grow. If these maintenance needs go

untended, they become renewal, renovation, and even replacement needs that place further demands on the minor and major capital outlay accounts. Because their source of funding--COPHE--is the same, competition for these funds increases. The temporal and unstable nature of this funding source also creates problems for long-range planning for ongoing maintenance expenses.

In addition, the challenge of adequate facilities maintenance is so broad that campus officials cannot hope to meet it alone. The effort to save facilities requires the active involvement of faculty, board members, State, federal, and local officials, foundations, corporations, and even private citizens (Landry and Mebane, 1982).

The challenge set by the facilities maintenance dilemma can be traced to three causes: (1) insufficient funding, (2) diversion of funding to other priorities, and (3) inadequate maintenance procedures. The University estimates its aggregate annual deficit for current facilities maintenance is now $24 million. Numerous community colleges have deferred maintenance needs because recent appropriations have been insufficient to cover all expenses. Recent appropriations for deferred maintenance have been between 10 and 50 percent of estimated need. Differences between budgeted allocations and expenditures for facilities maintenance and deferred maintenance, as well as statements by institutional leaders, attest to recent pressures which have caused diversion of some of these funds to areas with higher institutional priority. Maintenance program improvements in the three segments reflect an awareness of the need also to improve maintenance procedures and utilize existing resources more effectively. The resolution of the problem ultimately resides in confronting the factors that caused it.

INCREASED FUNDING

An increase in State appropriations is the most often cited solution to the facilities maintenance dilemma. However, higher education in California has already experienced repeated budget reductions in the 1980s and preservation of even existing funding levels may be in jeopardy. Because institutional and segmental hopes for adequate State funding are likely, at least in part, to remain unrealized, alternative funding should be explored. Four seem promising:

- One possible source of funds is a State revenue bond that could provide support for capital development and deferred maintenance for California public higher education. While recent market conditions--interest rates, competition, and low demand--have not been favorable, an improvement in the economy may make this option more attractive.

- A second funding source more directly within the control of institutions is fund raising. Long the domain of private higher education, fund raising among alumni, the public, foundations, and corporations is increasing among public institutions. While most of these efforts have focused on support for the academic program, interest in fund raising for capital development and maintenance is growing.

- A third possibility is student support. In the past, student fees have supported deferred maintenance expenses in only one segment--the University of California. Both the University and the State University have used student fees revenues partially to fund current maintenance of plant, and this proportion of student support has increased as State General Fund support has decreased. Using student fee revenues to support plant operation and maintenance costs related to student services facilities follows the spirit of the Master Plan, but in the State University the students' proportional share seems to have reached a magnitude that exceeds these costs. Current State policy on the appropriate share of these costs to be borne by students is sufficiently unclear to warrant clarification.

- Fourth is the federal government. In recognizing the major deterioration of public works projects throughout the United States, the federal government has sought to dedicate specified revenues to the repair and rehabilitation of the country's roads and bridges. Recognizing the role institutions of higher education play in the development of human capital and its importance to the economic health of the nation suggests that these institutions are also public assets worthy of federal assistance. Establishment of federal funding similar to Title II funding under the Public Works Employment Act of 1976 could assist in reducing unmet maintenance needs, especially if it was a supplement to, and not a substitute for, State funding.

TARGETED FUNDING AND BETTER PLANNING

Several efforts will be increasingly important in securing adequate funds:

- Documentation of projects through costs estimates and accurate descriptions which include specification of their roles in the overall maintenance program and for educational facilities in general.

- Assurance that funds will be expended as described.

- Use of explicit criteria for establishing priorities among maintenance, renewal, and replacement projects as well as standard definitions and methodologies for evaluating plans and projects.

- Review of the results of funding on the institutional maintenance program.

- Development of plans to eliminate the backlog of maintenance projects.

Currently, most physical plant administrators are engulfed by short-term survival efforts coping with inflation, escalating energy costs, and federal and State code requirements, such as access for the handicapped students. If facilities maintenance is to receive adequate attention, institutional officers must become more familiar with the financial link between programs and facilities, and physical plant administrators must come to view facilities in terms of programmatic needs. Academic leaders and directors of facilities must determine the most effective fit between present and pro-

jected facilities and academic program needs for the next 10 to 25 years by integrating facilities resource planning with academic program planning. Decision makers at all levels must recognize the dependence of the educational process on adequate facilities so that decisions regarding facilities are made within the context of the educational process (Zachar, 1980).

Academic planners who have examined the dilemmas surrounding capital maintenance agree about the components of facilities resource planning. According to the task force of the Association of Governing Boards and the National Association of College and University Business Officers that reviewed facilities resource planning in 1979, such a plan should:

- be based on sound planning policy which includes consideration of both programs and facilities,
- provide a systematic approach to the maintenance of facilities,
- establish criteria for budgeting maintenance expenditures,
- document the extent of the deferred maintenance backlog,
- require a planned preventive maintenance program as a prerequisite for funding deferred maintenance needs, and
- include ongoing evaluation of fiscal requirements and the priorities for all capital plant expenditures.

Planning and policy development which is broad based in terms of represented constituents is most likely to assure optimum use of resources and realistic expectations of available resources. Integrating facilities needs with academic program needs not only assists facilities personnel to understand the tradeoffs among institutional priorities but also helps academic personnel understand the role of facilities in the overall mission of the institution. Such institutional and segmental planning can help keep diversion of funding to a minimum.

IMPROVED MAINTENANCE PROCEDURES

The review and improvement, where necessary, of maintenance procedures is fundamental not only to the effective use of all available resources but also the possibility of increasing this funding. A crucial element is an effective preventive maintenance program. Preventive maintenance programs do, at least in theory, exist in all three segments, and all three segments have made varying levels of progress in improving these programs by addressing the issues of funding, expertise, and clear procedures. Institutional and segmental policy should include a precise definition of what the program should accomplish and detailed procedures for the program's implementation. These should include specification of the staffing requirements, in terms of numbers of personnel as well as their skills, and these requirements should be compared to existing staffing, providing training and reallocation where

necessary. Finally, accountability procedures should be in place which insure that funds allocated for that purpose are used for preventive maintenance.

Procedures adequate to resolve the facilities maintenance dilemma must involve new techniques for identifying and correcting maintenance problems for less money. For example, the State University is trying new technologies for precisely locating leaks in roofs so that patching will be more effective, thus delaying the need for reroofing. Furthermore, such new techniques and related maintenance equipment should be shared among institutions regionally and intersegmentally. The long-term effectiveness of public higher education in California will require such coordination to stem the tide of deferred maintenance and the deterioration of the physical plant.

BIBLIOGRAPHY

In addition to the references cited below, this report incorporates information from numerous segmental documents provided by members of the technical advisory group for the study.

Association of Physical Plant Administrators. 1980-81 Comparative Costs and Staffing Report for Physical Plants of Colleges and Universities. Washington, D.C.: Association, 1982.

Beavers, Gerald. "Deferred Maintenance, Big Problem, Small Funding--Whom Do We Need to Convince." Paper presented at the Deferred Maintenance Conference of Association of Physical Plant Administrators, San Diego, July 14-15, 1980.

Bowman, William W. "Defer Maintenance, Invite Disaster," AGB Reports, 19:6, (November-December 1977) 12-16.

California Master Plan Survey Team. A Master Plan for Higher Education in California, 1960-75. Sacramento: California State Department of Education, 1960.

California State University and Colleges. Report of the Task Force on Plant Maintenance. Long Beach: Office of the Chancellor, November 1980.

Cheit, Earl F. The New Depression in Higher Education: A Study of Financial Conditions at 41 Colleges. New York: McGraw-Hill, 1971.

Fink, Ira. "Campus Planning in the 1980s: The Competition for Space," Planning for Higher Education, 9:1 (November 1980) 1-11.

Howell, Paul C. "Preventive Maintenance is a Lost Art, Study Reveals," School Business Affairs. 43:2 (February 1977) 35-38.

Halpern, Sheldon. "Why Old Main Looks So Shabby," Chronicle of Higher Education, May 19, 1982, p. 56.

Glenny, Lyman A. and Bowen, Frank M. Signals for Change--Stress Indicators for Colleges and Universities. Sacramento: California Postsecondary Education Commission, September 1980.

Jenny, Hans; Hughes, Geoffrey C.; and Wynn, G. Richard. "Taking Capital Requirement into Account," in Carol Frances (ed.) Successful Responses to Financial Difficulty: New Directions for Higher Education 38. San Francisco: Jossey-Bass, June 1982.

Joint Committee on the Master Plan for Higher Education. Report of the Joint Committee on the Master Plan for Higher Education. Sacramento: California Legislature, September 1973.

Kaiser, Harvey H. "Facilities Management: A Program for the 1980s." Managing Facilities More Effectively: New Directions for Higher Education 30. San Francisco: Jossey-Bass, 1980.

--. Mortgaging the Future: The Cost of Deferring Maintenance. Washington, D.C.: Association of Physical Plant Administrators, 1979.

--. "Tear Down Old Main," AGB Reports, 24:2 (March-April 1982) 8-11.

Kraft, Walter W. "Budgeting for Maintenance Should be Based on Present Replacement Cost," College and University Business, 8:4 (May 1950), 37-4[illegible]

Landry, Lawrence L. and Mebane, Rodney. "Capital Crisis in Higher Education," Business Officer 15:8 (February 1982) 20-22.

--. "Money for Old Main," AGB Reports, 24:2 (March-April 1982) 12-16.

Lane, Richard N., Jr. "Deferred Maintenance--Where Are We Today?" Proceedings of the 68th Annual Meeting of the Association of Physical Plant Administrators, Oklahoma City, May 10-13, 1981. Washington, D.C.: The Association, 1981.

McCorkle, Chester O., Jr. and Archibald, Sandra Orr. Management and Leadership in Higher Education - Applying Modern Techniques of Planning, Resource Management and Evaluation. San Francisco: Jossey-Bass, 1982.

Minter, J. and Bowen, H. R. Independent Higher Education: Fifth Annual Report on Financial and Educational Trends in the Independent Sector of American Higher Education. Washington, D.C.: National Association of Independent Colleges and Universities, 1980.

Mortimer, Kenneth P. and Tierney, Michael L. "The Three R's of the Eighties: Reduction, Reallocation, and Retrenchment," AAHE-ERIC Higher Education Research Report 4, Washington, D.C.: American Association of Higher Education, 1979.

NACUBO-AGB Task Force. "Where the Money Goes," AGB Report, 21:1 (January-February, 1979) 27-28.

National Center for Education Statistics, Digest of Education Statistics, Washington, D.C.: U.S. Government Printing Office, 1981.

--. Financial Statistics of Institutions of Higher Education. Washington, D.C.: U.S. Government Printing Office, 1981.

Rogers, Edward. Statement on Tideland Oil Revenue: Potential Income and Potential Uses Before the Joint Interim Hearings, November 14, 1979. Unpublished. Sacramento: California Community Colleges.

Semans, H. H. and Holy, T.C. A Study of the Need for Additional Centers of Public Higher Education in California. Sacramento: California State Department of Education, 1957.

Smith, Thomas B. "How to Attack Deferred Maintenance," American School and University, 52:2 (October 1979) 84-91.

University of California. "Item for Discussion: Report on the University's Facilities Needs in the 1980s." Regents' Agenda of January 21, 1983. Berkeley: Office of the President, January 12, 1983.

WICHE. "Fiscal Constraints Emphasize Need for Planning," WICHE Reports on Higher Education in the West, 26:3 (Autumn 1981) 2-3.

Zachar, Sy. "Attitudes Toward the Physical Plant, Common Threads Nationally." Paper presented at the APPA Deferred Maintenance Conference of the Association of Physical Plant Administrators, San Diego, July 14-15, 1980.